

WHAT IS CLAIMED IS:

1. A vehicle front and rear wheels drive system having a speed-changeable change-speed apparatus disposed along a power transmission path extending from  
5 primary drive wheels to secondary drive wheels, said change-speed apparatus having a composite planetary gear device provided in a casing fixed to a vehicle body, comprising:

changeover clutch discs for, respectively, a direct  
10 coupling clutch and a change-speed clutch disposed on a movable element provided concentrically with an input shaft or an output shaft of said change-speed apparatus to which power is transmitted from said primary drive wheels, said movable element being adapted to move along  
15 an axial direction of said input shaft or said output shaft and meshing with a carrier of said composite planetary gear device in such a manner as not to rotate relative to said carrier; and

an elastic body and an actuator both for changing  
20 over a state between engagement and disengagement of said direct coupling clutch or said change-speed clutch, said elastic body and said actuator being disposed such that operating directions of said elastic body and said actuator are opposed to each other in the axial direction;

25 wherein said elastic body brings one of said direct coupling clutch and said change-speed clutch into engagement by moving said movable element by virtue of

a biasing force thereof, and

said actuator changes over the engagement of said clutches from the engagement of said one clutch to the engagement of the other clutch by moving said movable  
5 element against the biasing force of said elastic body by virtue of a thrust of the actuator.

2. The vehicle front and rear wheels drive system according to claim 1, wherein said actuator releases the  
10 engagement of said one clutch by moving said movable element against the biasing force of said elastic body while moving a clutch disc of said other clutch by virtue of the thrust of the actuator so as to bring said clutch disc of said other clutch into engagement with said  
15 changeover clutch disc disposed on said movable element.

3. The vehicle front and rear wheels drive system according to claim 1, wherein said actuator brings said other clutch into engagement after having released the  
20 engagement of said one clutch by moving said movable element against the biasing force of said elastic body by virtue of the thrust of the actuator.

4. The vehicle front and rear wheels drive system  
25 according to claim 1, wherein said changeover clutch discs, respectively, for said direct coupling clutch and said change-speed clutch are disposed in two stages in a radial

direction across said movable element, and

wherein said changeover clutch disc situated on an inner circumferential side engages with a clutch disc disposed on either said input shaft or said output shaft, while said changeover clutch disc disposed on an outer circumferential side engages with a clutch disc disposed on said casing.

5. A clutch changeover method for changing over clutches in a change-speed apparatus having a direct coupling clutch and a change-speed clutch which are disposed on a movable element provided concentrically with an input shaft or an output shaft to which power is transmitted, said movable element being adapted to move along an axial direction of said input shaft or said output shaft, and an elastic body and an actuator both for changing over a state between engagement and disengagement of said direct coupling clutch or said change-speed clutch, said elastic body and said actuator being disposed such that operating directions of said elastic body and said actuator are opposed to each other in the axial direction, said clutch changeover method comprising the steps of:

keeping one of said direct coupling clutch and said change-speed clutch in engagement by normally moving said movable element in one direction by virtue of a biasing force of said elastic body; and

changing over the engagement of said clutches from said one clutch to the other clutch by moving said movable element against the biasing force of said elastic body by activating said actuator.

5

6... The clutch changeover method according to claim 5, wherein one of said direct coupling clutch and said change-speed clutch is kept in engagement by normally moving said movable element in one direction by virtue  
10 of a biasing force of said elastic body, and

wherein the engagement of said one clutch is released by moving said movable element against the biasing force of said elastic body while bringing the other clutch into engagement by activating said actuator...

15

7... The clutch changeover method according to claim 5, wherein one of said direct coupling clutch and said change-speed clutch is kept in engagement by normally moving said movable element in one direction by virtue  
20 of a biasing force of said elastic body, and

wherein said other clutch is brought into engagement after the engagement of said one clutch has been released by moving said movable element in the other direction against the biasing force of said elastic body by actuating  
25 said actuator.